3.6 Common Factors

Factor the number 40.

$40 = 2 \times 2 \times 2 \times 5$

2 x 20
2 x 10
2 x 5

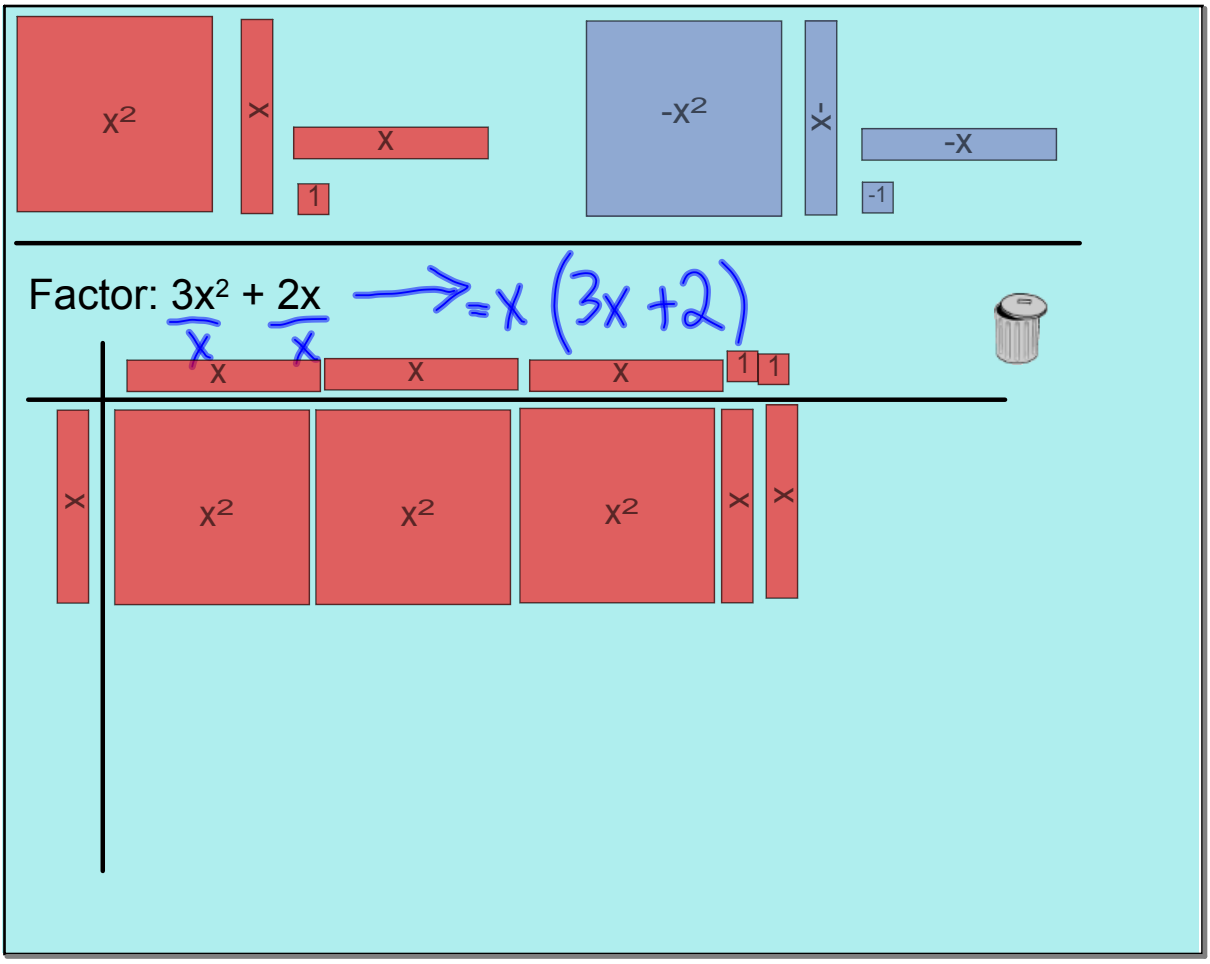
What does it mean to factor?

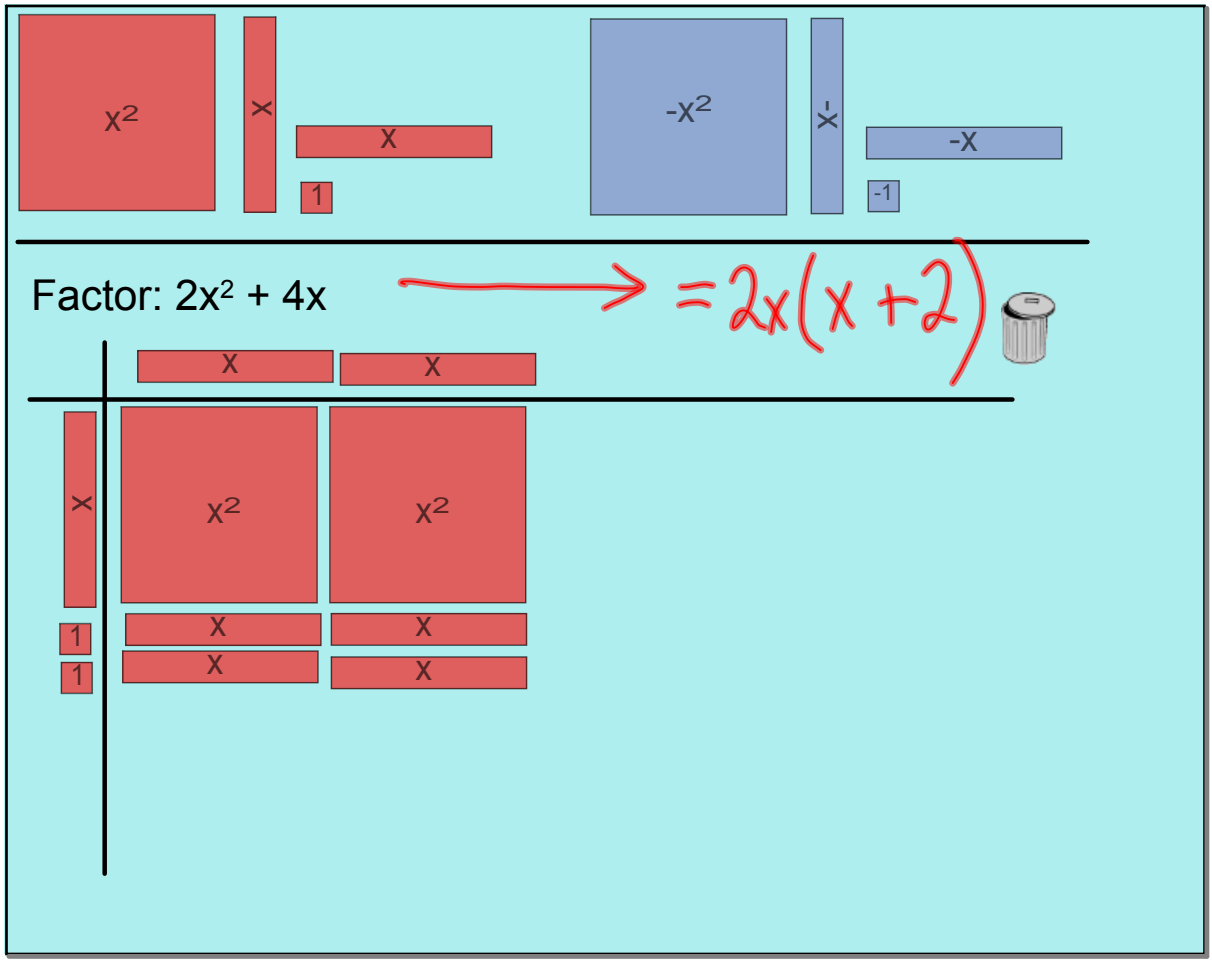
Represent as a product of prime factors.

1. Using a Model (e.g., alge-tiles)

Model the expression as an area. The lengths of the sides are factors.

Some factors can be reduced further. Repeat this process until no factors can be reduced.





2. Factor Algebraically

Look for the Greatest Common Factor of the coefficients and the GCF of the variables.

Ex.1 Factor: $8x^3 - 6x^2y^2 + 4x^2y$

The GCF of 8, 6, and 4 is 2.

The GCF of x^3, x^2y^2, and x^2y is x^2.

$8x^3 - 6x^2y^2 + 4x^2y$ = $2(4x^3 - 3x^2y^2 + 2x^2y)$

= $2x^2(4x - 3y^2 + 2y)$

Ans

3. Factoring by Grouping

Some polynomials do not have common factors in all terms. They can sometimes be factored by grouping terms with common factors.

Ex.2 Factor: ac + bc + ad + bd

let $(a+b)=x$

$= c(a+b)+d(a+b)$

$= cx + dx$

$= x(c+d)$

$= (c+d)(a+b)$

Factor

a) $5x + 25$

$=5(x+5)$

b) $24xy^2 + 16x^2y$

$=8xy(3y+2x)$

c) $5x(a+b) +3(a+b)$

$=(a+b)(5x+3)$

d) $3t(x+y)-(x+y)$

$=(x+y)(3t-1)$

e) $m^2-4n+4m-mn$

$=m^2+4m-4n-mn$

$=m(m+4)-n(4+m)$

$=(m-n)(4+m)$

f) $5m^2t-10m^2+t^2-2t$

$=5m^2(t-2)+t(t-2)$

$=(5m^2+t)(t-2)$

Factor

g) $3y^2 - 9y - 20$

No GCF

h) $3m^3n^2 + 18m^2n^3 - 12mn^2$

$= 3mn^2(m^2 + 6mn - 4)$

i) $4t(m+7) + (m+7)$

$= (m+7)(4t+1)$

j) $4y(p+q) + x(-p-q)$

$= 4y(p+q) - x(p+q)$

$= (4y-x)(p+q)$

k) $3t(x-y) - (x+y)$

No GCF

Assigned Work:

p.202-203 # 1, 3bd, 5bc, 6def, 7, 8, 9, 10